

## **TELEBASIS AUREA (ODONATA: ZYGOPTERA: COENAGRIONIDAE), A NEW SPECIES OF DAMSELFLY FROM COSTA RICA<sup>1</sup>**

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**ABSTRACT:** A new species of Zygoptera, *Telebasis aurea*, from southeastern Costa Rica, is described and figured. Brief notes on its ecology and probable relationships are provided.

**RESUMEN:** Una nueva especie del suborden Zygoptera es descrita e ilustrada para América Central: *Telebasis aurea* para el sureste de Costa Rica. Se brindan, además, breves notas acerca de sus ecología y probables relaciones específicas.

The Zygoptera of the neotropics, although better studied than most tropical taxa, are still poorly known. Merely to catalog the diversity of that region is a monumental task facing biologists over the next decades. What follows is intended as a small contribution to that effort.

The genus *Telebasis* is endemic to the New World and is principally Neotropical, with about 28 species (Tsuda, 1991). *Telebasis* has not been treated comprehensively, but Calvert (1901-1908, 1909) and Kennedy (1936) clearly illustrated diagnostic features for males of many species. Comparison with descriptions and/or authoritatively identified specimens of all the regional species confirm that the species described here is new.

### **TERMINOLOGY AND METHODS**

Terminology for the caudal appendages follows Snodgrass (1954), for the penis Miller and Miller (1981), and for the wing veins Tillyard and Fraser (1938-1940).

All measurements are in mm and were made with a ruler (to 0.5 mm) or a filar micrometer (to 0.1 or 0.01 mm). Total length and abdomen length include the cerci. Cerci and paraprocts were measured in lateral view from about mid-height of each (not from a common point) to its tip. Ovipositor lengths exclude the styli. Illustrations were modified from sketches made using a Wild<sup>R</sup> stereo microscope equipped with a camera

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lucida and/or tracings of electron micrographs made with an Hitachi<sup>R</sup> S-510 scanning electron microscope. All specimens are preserved dry in transparent envelopes.

Collections referred to are abbreviated as follows: ANSP—Academy of Natural Sciences, Philadelphia; FSCA—Florida State Collection of Arthropods (Gainesville); IORI—International Odonata Research Institute (Gainesville); MLM—personal collection of M. L. May (New Brunswick).

### *Telebasis aurea*, spec. nov.

(Figs. 1A-E)

**Material examined:** Holotype: ♂ (#1), Costa Rica, Prov. Puntarenas, Peninsula de Osa, pond 5 mi. S. of Rincon, 10 August 1970, in tandem with allotype, coll. by M. L. May, IORI. Allotype: ♀ (#2), same data as holotype. Paratypes: 1 ♂, 1 ♀ (pair in tandem, #'s 3, 4), 1 ♂ (not paired, #5), same data as holotype, MLM; 1 ♂, 1 ♀ (pair in tandem, #6, 7), same data as holotype, FSCA.

**Etymology:** *aurea*, Latin for golden, referring to the color of the male.

**Diagnosis:** A large and robust species with the rear of the head mostly black, the dark middorsal pterothoracic stripe fairly wide, and the abdomen nearly lacking dark markings. The golden orange color of the male is distinctive, as are the shapes of the caudal appendages and penis (Figs. 1A-D). The female is distinguished by the presence and shape of the prothoracic processes and the pits on the middle lobe of the prothorax (Fig. 1E).

**Holotype:** Right metathoracic leg and left metathoracic tarsus missing, small crack on left side of anterior mesepisternum.

Head with labrum and entire anteriorodorsal surface golden orange. Dorsum shiny black posterior to line extending from midpoint of each eye to just anterior to lateral ocelli, thence anteriorly to median ocellus. Small, orange bar along occipital ridge, rear of head black except ventral eye margins. Mouthparts yellowish, apexes of mandible and maxillae black.

Prothorax dull orange dorsally, greenish yellow on pleura, with dark area on either side of midline of middle lobe and along sulcus between middle and hind lobe. Pterothorax with black middorsal stripe (including middorsal carina and antealar sinus but not antealar ridge or mesostigmal plates) widening from 1/3 width of mesepisterna at anterior end to about 3/5 width posteriorly, finally expanded to mesopleural suture just before antealar ridge; remainder of sclerite golden orange. Dark lateral markings including elongate spot on shallow fossa near upper end of mesopleural suture; stripe about 1/2 width of mesepimeron, extending from anterior bulge to extreme posterior end of sclerite, where much narrower along interpleural suture; hairline along metapleural suture. Remainder of thorax yellowish with slight greenish cast, except tan on mesinfraepisternum and extreme anterior mesepimeron; venter unmarked. Legs mostly pale, black on extensor surfaces and extreme apexes of femora and on flexor surfaces of all tibiae and external angle of protibiae, tarsi dark brown. Wing membranes distinctly flavescent, veins dark brown, pterostigmata tan; vein R<sub>3</sub> branching from R<sub>2</sub> just before 7th (forewing) or 6th (hindwing) postnodal crossvein.

Abdomen almost entirely golden orange, paler with greenish cast laterally on segment 1 and anterior end of 2, with brownish cast on 9 and 10; black dorsal spot on basal 1/2 of 1,

also with sperm vesicle, margins of hamules, subapical denticles on segments 7-9, and diffuse dorsal stripes on basal 1/2 of 9 and full length of 10 black. Third abdominal segment 5.9 times as long as its height at midlength, 2.3 times as long as segment 2. Cerci 0.50 mm., brown with black medial tooth; paraaprocts 0.51 mm. brown, very broad basally, much narrower apically and curved upward and inward (Figs. 1A, B). Penis not extruded but presumably as in Figs. 1C, D.

**Measurements:** Total length—37.0, abdomen—29.0, hindwing—21.0.

**Allotype:** Both antennae with flagella broken off, pterothorax cracked along anterior margin of mesepisternum and anterior mesepimeron, abdomen somewhat compressed laterally.

Head pattern as in holotype, pale colors dull brownish yellow, with slight bluish-green tint on labrum; distinct dark mediobasal spot and basal marginal streaks on labrum, diffuse spots on postclypeus. Eyes brown.

Prothorax brownish yellow with dark, laterally concave dorsal stripe covering median 1/2 of middle and hind lobes and sulcus between anterior and middle lobes; small dark spot just beneath notopleural suture. Pair of divergent, straight, tapering but terminally rounded, flat processes, closely appressed to prothoracic dorsum, each extending from anterior edge of hind lobe to near medial edge of a distinct excavation at about midlength of middle lobe. Posterior lobe with margin sinuate and semi-erect. Pterothorax brownish yellow, dark markings as in holotype except all stripes slightly wider, C-shaped black mark on each mesinfraepisternum. Mesostigmal plates with black stripe crossing each at midwidth. Mesepisterna with distinct, black pit just behind middle of each mesostigmal plate. Legs as in holotype but with dark areas more extensive, slight pruinescence at bases. Wings hyaline; vein  $R_3$  branching from  $R_2$  at 5th-6th (forewing) or 5th (hindwing) postnodal crossvein.

Abdomen marked much as in male, pale color ochre. Sternum mostly black, dorsal and pair of lateral dark streaks on segment 7, basal 2/3 of 8 and all but distal margin of 10 dark, cerci and ventral half of ovipositor dark. Third abdominal segment 4.1 times as long as its height at midlength (height excludes visible portion of sternum but still slightly exaggerated due to abdominal compression), 2.2 times as long as segment 2. Ovipositor 1.46 mm.

**Measurements:** Total length—37.5, abdomen—29.0, hindwing—21.0.

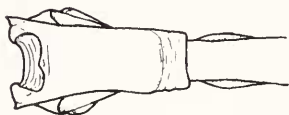
**Variation among paratypes:** Males: Coloration like holotype except all 3 with slightly wider dark thoracic stripes, extent of dark on terminal abdominal segments variable, one with dorsum of 7 largely dark; wings hyaline (slightly immature specimen?) to strongly flavescent;  $R_3$  branching from  $R_2$  at 5th-7th (f.w.) or 5th-6th (h.w.) postnodal; third abdominal segment 5.2-5.8 times as long as high. Females: coloration as in allotype, both with more pruinescence on and around bases of legs; third abdominal segment 4.6 times as long as high. Eyes in life black above, dull lime green below in males, brown above, tan below in females (Paulson, in litt.).

## DISCUSSION

All specimens were taken from a semipermanent pond in seasonal moist forest on the Osa Peninsula in southeastern Costa Rica. The pond was completely surrounded by trees but was large enough to receive sunlight during much of the day. Abundant submerged and emergent



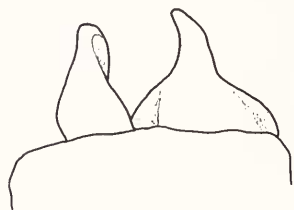
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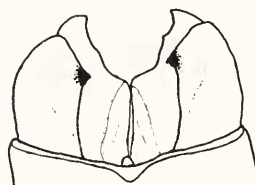
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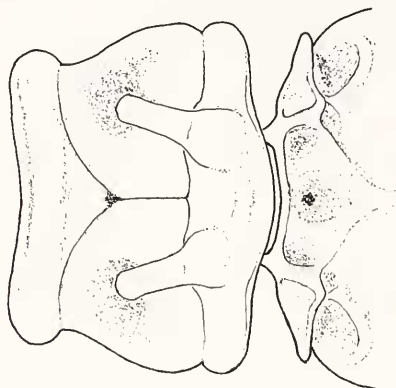
C



A



B



F



vegetation grew around its perimeter, and the *Telebasis* flew mainly among the latter, often in tandem pairs. I observed mature individuals only after 10:00 h; numerous teneral specimens could be flushed from the vegetation, especially from about 06:00 to 08:30. Associated Odonata included *Lestes scalaris* Gundlach, *Acanthagrion inexpectum* Leonard, *A. trilobatum* Leonard, *Erythemis haematogastra* (Burmeister), *Micrathyria atra* (Martin), *M. dictynna* Ris, *M. pseudeximia* Westfall, *Nephepeltia phryne* (Perty), *Orthemis ferruginea* (F.), and *Perithemis mooma* Kirby. D. L. Paulson has also taken what is apparently *T. aurea* (in litt.; specimens were not examined) at San Vito de Java, C. R., at an elevation of about 1500 m.

*Telebasis aurea* is one of the largest Central American *Telebasis*, and the only one with the males of the distinctive color that suggested its name. Among the regional species *T. garleppi* Ris may be longer, but it is a more slender insect (third abdominal segment 6.7-7.3 times as long as high in 3 males, 5.5 times as long as high in 1 female), it lacks the dark mespimeral stripe, and the black color of the epicranium extends forward to the bases of the antennae; the abdominal color of males is the typical red or red-orange of most *Telebasis*, the cerci are strongly convex dorsally and about as high as long, and the penis bears well-developed pre-apical lateral lobes; the female prothorax is similar to that of *aurea* but the forward-projecting processes each curve inward and slightly upward to an acute tip that lies medial to the lateral excavations of the middle lobe. *Telebasis theodori* (Navas), from southern South America, is similar in color, especially in having flavescent wings, but differs in other characters, including the shape of the male caudal appendages, the pale color of the rear of the head, and the much less extensive dark markings of the pterothorax (Jurzitza, 1980; Garrison, 1991, showed that Jurzitza's *T. aureipennis* is a synonym of *T. theodori*).

Relationships within the genus are not well understood, but the forms of the male caudal appendages and penis suggest a possible alliance with *T. coccinata* Calvert, *T. salva* (Hagen), and perhaps *T. livida* Kennedy. The female shares with several species the character of strap-like projections extending over the middle lobe of the prothorax, but their shape, together with the depth and position of the excavations beneath and/or lateral to them (Fig. 1E) is distinctive).

Figure 1 (opposite): *Telebasis aurea* spec. nov. A—male caudal appendages, lateral view; B—male caudal appendages, dorsal view; C—right cercus of male, dorsomedial view; D—head and distal shaft of penis, ventral view; E—head and distal shaft of penis, lateral view; F—prothorax and mesostigmal laminae of female, dorsal view. Scale bar = 0.5 mm for A, B, C, F; 0.3 mm for D, E.

The following key will separate all the species of *Telebasis* known to occur in Mexico and Central America. Further information on the known range of each species, except *aurea*, appears in Paulson (1982) and Tsuda (1991).

## Keys to *Telebasis* of Mexico and Central America

### Males

- 1 Cerci much longer than paraprocts, in profile their dorsal margin strongly convex, ventral margin straight or smoothly concave in apical 2/3 ..... *corallina*
- 1' Cerci subequal to or shorter than paraprocts, not shaped as above ..... 2
- 2(1') Posterior surface of head largely black ..... 3
- 2' Posterior surface of head largely pale ..... 8
- 3(2) Paraprocts about 1/2 the length of abdominal segment 10 at midheight, blunt apically; mesepisterna almost wholly black; small species, hindwing no longer than 13 mm ..... *filiola*
- 3' Paraprocts much more than 1/2 the length of abdominal segment 10, tapering and more or less acute apically; mesepisterna usually not almost wholly black (except some *digiticollis*); larger species, hindwing usually longer than 15 mm ..... 4
- 4(3') Abdominal segments 4-7 mostly black dorsally; cerci, in dorsal view, wider than long ..... *collopietes*
- 4' Abdominal segments 4-7 mostly red or golden orange dorsally; cerci, in dorsal view, longer than wide ..... 5
- 5(4') Pale color of abdominal dorsum mostly golden orange; black on epicranium extending anteriorly barely beyond ocelli; cerci and paraprocts nearly equal in length; hindwing 20 mm or longer ..... *aurea*
- 5' Pale color of abdominal dorsum mostly red or orange-red; black on epicranium extending anteriorly at least to bases of antennae; paraprocts distinctly longer than cerci, or, if not, hindwing shorter than 20 mm ..... 6
- 6(5') Cerci, in profile, about as long as high; middle lobe of pronotum mostly pale; hindwings generally longer than 20 mm ..... *garleppi*
- 6' Cerci, in profile, distinctly longer than high; middle lobe of pronotum mostly black; hindwings generally shorter than 20 mm ..... 7
- 7(6') Cerci about 3/4 length of paraprocts, or less, and, in dorsomedial view, appearing rounded at apex (similar to Fig. 1 C); mesepimeron with narrow black stripe often extending most of length of sclerite ..... *digiticollis*
- 7' Cerci nearly as long as paraprocts and, in dorsomedial view, appearing squarely truncate at apex; mesepimeron usually with black stripe absent or reduced ..... *griffinii*
- 8(2') Paraprocts truncate at apexes, only slightly longer than cerci; pale color of thorax mostly pale green, mesepisterna with black middorsal stripe uniform in width, mesepimera without dark markings ..... *isthmica*
- 8' Paraprocts tapering and more or less acute at apexes, at least 1/3 longer than cerci; pale color of thorax mostly orange or red, mesepisterna with black middorsal stripe abruptly widened near posterior end, mesepimera with dark stripe or spot ... 9
- 9(8') Cerci, in ventrolateral view, with black subapical tooth bifid; Baja California only ..... *incolumis*
- 9' Cerci, in ventrolateral view, with subapical black tooth not bifid; widespread ..... *salva*

## Females

1	Posterior surface of head largely black .....	2
1'	Posterior surface of head largely pale .....	7
2(1')	Dorsum of abdominal segments 1-3 and 8-10 pale, 4-7 black; pronotum without elongate processes .....	<i>collopietes</i>
2'	Dorsum of abdominal segments 1-9 more or less concolorous, or 8-10 only with diffuse dark areas; pronotal sculpturing variable .....	3
3(2')	Dorsum of abdomen largely pale; pronotal processes strap-like, appressed to surface of pronotum .....	4
3'	Dorsum of abdomen largely black or bronze; pronotal processes erect or absent .....	5
4(3')	Pronotal processes slightly divergent, rounded apically (Fig. 1F); abdominal segment 3 about 4.5 times as long as its height at midlength .....	<i>aurea</i>
4'	Pronotal processes slightly convergent in distal 1/2, subacute apically; abdominal segment 3 about 5.5 times as long as its height at midlength .....	<i>garleppi</i>
5(3')	Mesostigmal plates each with large, posterodorsally-projecting lobe; small species, hindwing no longer than 13 mm .....	<i>filiola</i>
5'	Mesostigmal plates without large projecting lobe; larger species, hindwing usually longer than 15 mm .....	6
6(5')	Pair of erect, divergent processes projecting anterodorsally from hind lobe of pronotum .....	<i>digiticollis</i>
6'	Pronotum without erect processes .....	<i>griffinii</i>
7(1')	Pronotum without erect or strap-like processes projecting from hind lobe; mesepisterna with middorsal stripes obscure, or brown with only lateral margins black .....	<i>isthmica</i>
7'	Pronotum with erect or strap-like processes arising from hind lobe; mesepisterna with distinct, black middorsal stripe, only middorsal carina pale .....	8
8(7')	Mesepisterna with black middorsal stripe uniform in width; mesostigmal plates each with distinct lateral protuberance, separated from main part of plate .....	<i>corallina</i>
8'	Mesepisterna with black middorsal stripe abruptly widened near posterior end; mesostigmal plates without separated lateral protuberances .....	9
9(8')	Pronotal processes distinctly divergent, arising at or near midlength of hind lobe, extending almost vertically and not overhanging middle lobe; Baja California only .....	<i>incolumis</i>
9'	Pronotal processes nearly parallel, arising from anterior 1/3 of hind lobe, extending somewhat anteriorly and usually partly overhanging middle lobe; widespread .....	<i>salva</i>

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